Drawing Amendments

Please replace item '76' with '78' as shown in Figure 4 in the proposed replacement sheet.

Remarks

Thorough examination by the Examiner is noted and appreciated.

The Drawings have been amended to overcome Examiners objections to the drawings.

The Specification has been amended to correct errors and overcome Examiner objections to the drawings.

The claims have been amended and new claims added to clarify Applicants disclosed and claimed invention.

No new matter has been added.

For example, support for the amendments is found in the originally presented claim, the Figures, including Figure 4 and in Specification e.g., at paragraph 0037 (as amended):

"[0037] As the metal layer 74 is electroplated onto the wafer 54, the contact ring 50 of the thrust pad assembly 40 **applies pressure** of variable magnitude **against the backside 57 of the wafer** 54, as follows. As shown in FIG. 3, central air pressure 45

is directed from the central air source 76 through the respective central air openings 44 of the air platen 42 and against the upper surface 49 of the thrust pad 48 at a pressure of typically greater than about 14 psi. Similarly, peripheral air pressure 47 is directed from the peripheral air source 77 through the respective peripheral air openings 46 of the air platen 42 and against the upper surface 49 of the thrust pad 48 at a pressure of typically less than about 14 psi. Accordingly, the central portion of the contact ring 50 applies a pressure of typically greater than about 14 psi to the **backside 57 of the wafer 54,** whereas the **peripheral portion of the contact ring 50 applies a pressure of typically less than about 14 psi to the backside 57 of the wafer 54.** Because the ohmic contact between the contact ring 50 and the wafer 54 is directly proportional to the pressure applied by the contact ring 50 against the wafer backside 57, the electrical resistance between the anode 66 and the cathode/wafer 54 at the edge region 54b of the wafer 54 is correspondingly ~~less~~ higher than the electrical resistance between the anode 66 and the cathode/wafer 54 at the center region 54a of the wafer 54. Consequently, the electroplated metal 57a is **correspondingly thicker at the center region 54a than at the edge region 54b of the wafer 54 for a given period of electroplating time.** Typically, the electroplating process is carried out for a period of typically about 2 minutes to deposit an electroplated metal 74 having a thickness of typically at least about 7,000 angstroms at the center region 54a and a thickness of typically about 500-1000 angstroms at the edge region 54b of the wafer 54."

Claim Rejections 35 USC § 112

Claim 6 has been amended to overcome Examiners rejection.

Claim Rejections under 35 USC 102

1. Claims 1-4 and 7-10 stand rejected under 35 USC 102(b), as being anticipated by Lakshmikanthan et al. (US 6,228,233).

Lakshmikanthan et al. discloses a bladder assembly (130; Figure 2B) where the bladder assembly is adapted to press a substrate 121 against contact ring pins (119; Figure 2) where the substrate is between the contact ring and the substrate (see Abstract). Lakshmikanthan et al. disclose that the contact ring includes plurality of pins (119, Fig 2 or 26, Figure 1) about the peripheral portion of the substrate that extend radially inward over a narrow portion of the substrate (see col 1, lines 53-60; col 4, lines 50-51; col 6, lines 47-50; col 7, lines 16-20).

Lakshmikanthan et al. further disclose that a pressure or a vacuum may be applied to the backside of the substrate through a pumping system (159, Figure 2) while also operating the bladder assembly (col 7, lines 42-55). The pumping system 159 delivers pressure (or vacuum) through a centrally disposed port (141;

Figure 2) on mounting plate 132 (see col 5, lines 15-19) to a space between the mounting plate and the substrate.

The apparatus of Lakshmikanthan et al. overcomes the problem of backside nonuniformities on the substrate to achieve uniform contact resistances between the contact ring pins and substrate (frontside) to deposit a uniform metal layer on the substrate (frontside) (col 3, lines 5-19.

Thus, Lakshmikanthan et al. fail to disclose several aspects of Applicants invention including those elements in **bold type**.

"A thrust pad assembly for mounting a substrate in an electroplating system, comprising:

a contact ring adapted to electrically connect to the electroplating system **and engage a backside non-plating surface of the substrate**; and

a variable pressure application system adapted to operably engage said contact ring, said variable pressure application system **adapted to apply a central pressure to a center region of the substrate backside through said contact ring** and **a peripheral**

pressure less than said central pressure to an edge region of the substrate backside through said contact ring."

Thus, Lakshmikanthan et al. is clearly insufficient to anticipate Applicants discloses and claimed invention.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Examiner asserts without support in the teachings of Lakshmikanthan et al. that since the pressure delivered from the bladder system and the **pressure delivered to the backside of the substrate are separately controllable "Examiner concludes** that the variable pressure application system of Lakshmikanthan is **capable** of asserting a lower peripheral pressure and a higher central pressure on the wafer as claimed".

Even assuming, arguendo, that Lakshmikanthan et al. taught such **capability**, Lakshmikanthan et al. does not disclose Applicants structure and the structure of Lakshmikanthan et al. including the contact ring of Lakshmikanthan et al. could not operate as Applicants claim:

"**a contact ring adapted to** electrically connect to the electroplating system and **engage a backside non-plating surface of the substrate**; and

a variable pressure application system adapted **to operably engage said contact ring**, said variable pressure application system adapted to **apply a central pressure to a center region of the substrate backside through said contact ring** and a peripheral pressure less than said central pressure **to an edge region of the substrate backside through said contact ring**."

With respect to claims 2 and 8, Examiner is clearly mistaken that the mounting plate of Lakshmikanthan et al. 'reads on' Applicants thrust pad. It is clear that the structural relationship of the mounting plate and contact ring of Lakshmikanthan et al. is completely different than that of Applicants.

With respect to claims 4 and 10, Examiner is clearly mistaken, and is nowhere taught in Lakshmikanthan et al., that the mounting plate of Lakshmikanthan et al. is capable of accomplishing Applicants operable functions or discloses Applicants structure.

Claim Rejections under 35 USC 103

1. Claims 5-6 and 11-12 stand rejected under 35 USC 103(a), as being unpatentable over Lakshmikanthan et al., above, in view of Dordi et al. (US 6,416,647)

Applicants reiterate the comments made above with respect to Lakshmikanthan et al.

Even assuming *arguendo* a proper motivation to combine the teachings of Lakshmikanthan et al. and Dordi et al., the fact that Dordi et al. discloses a vacuum chuck having vacuum ports (channels disposed in a web-like fashion) (see 296; Figure 2; col 6, lines 34-36) on the chuck surface to provide suction during processing or a blow-off gas **during substrate transfers to**

prevent backside contamination, and where the vacuum ports (channels) are adapted to provide a **single pressure** (col 7, lines 5-22), does not further help Examiner in producing Applicants invention.

Moreover, the stated motivation by Examiner for modifying Lakshmikanthan et al. "in order to prevent backside contamination" would **change the principle of operation** of the apparatus of Lakshmikanthan et al., i.e., and make it **unsuitable for its intended purpose**, , i.e., the annual bladder assembly forms a seal with the backside of the substrate at the periphery while the central opening in the mounting plate of Lakshmikanthan et al., together with the sealed periphery allows pressure to be applied in order to cause outward bowing of the wafer.

"**First**, there must be some **suggestion or motivation**, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. **Second**, there must be a **reasonable expectation of success**. **Finally**, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success

must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).*

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." *In re Ratti, 270 F.2d 810, 123, USPQ 349 (CCPA 1959).*

"If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." *In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).*

Conclusion

The cited references, either individually or in combination, do not produce or suggest Applicants disclosed and claimed invention, and are therefore insufficient to make out a *prima facie* case of anticipation or obviousness with respect to both Applicants independent and dependent claims.

The Claims have been amended and new claims added to further clarify Applicants invention. A favorable consideration of Applicants' claims is respectfully requested.

Based on the foregoing, Applicants respectfully submit that the Claims are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

In the event that the present invention as claimed is not in condition for allowance for any reason, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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